PAO an elapse time of 55 hours, 38 minutes, 46 seconds. The - our present weight of the spacecraft is 62 915 pounds, Earth pounds. At 53 hours, 16 minutes into the flight, this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control Houston at 53 hours 34 minutes into the flight. Mike Collins is passing on a procedure to the crew, involving the use of that telephoto lens which we couldn't get to work yesterday. It will certainly be of interest to the broadcast media and hopefully, an interest to a lot of other people, too. Let's listen to this conversation.

CAPCOM Apollo 8, Houston.

SC Go ahead, Houston, Apollo 8.

CAPCOM Roger, Frank. I have got a lot of talking to do regarding TV cameras and brackets and whatnot. I would like to start in on it whenever you are ready to talk about it.

SC Let me get a piece of paper out.

CAPCOM Okay.

SC Go ahead.

CAPCOM Okay. First a question. Are you planning to show us TV pictures of the earth today?

SC Well, that is what we wanted to do. It seems that would be the most interesting thing we can show you, but we - you know, we had trouble with the lens.

CAPCOM Well, okay, that's good. All this procedure that I am going to give to you here is relative to what we hope are fixes to the lens and for looking your rendezvous window at the earth, and the gimbal angles and all that good stuff is based toward looking out the window at the earth rather than the moon. Over.

SC Roger.

CAPCOM Okay. First, unstow the red filter, the polarizing filter, the red and blue filter holder, and some tape. Over.

SC Okay, let me read this down.

CAPCOM Roger. I'd suggest that I got a whole page full.

SC Okay.

CAPCOM All right. Tape the red filter to the telephoto lens. That red filter is the 25A red filter, not the one that is in the red and blue filter slider.

SC Roger.

CAPCOM Attach telephoto lens to the camera.

SC Okay, we can figure out to do that, Roger.

CAPCOM Insure that the automatic light control, the ALC switch on the camera is the IN position. Over.

SC ALC IN, roger.

CAPCOM Roger. Attach camera to the adjustable TV bracket and attach the bracket to the TV mounting point

on the commander's side of the hatch to point out rendezvous window number 2.

SC Roger.

CAPCOM Okay. There is a note here that says use dovetail on top of camera, rather than the side dovetail. Use the dovetail on the top of the camera for mounting to bracket and place the rocking nut on the bracket down. And down means toward your -X direction.

SC Roger.

CAPCOM Okay. Say, this step I just got through giving you is somewhat complicated. You might want to get the camera set up early using the instructions I just gave you.

SC We are not ready yet.

CAPCOM Roger. I say again, the instructions that I just gave you should end up having the camera looking out the window and about 30 degrees yawed left from your +X axis, so I suggest you get the camera set up that way early and any problems that come back to us, we will talk them over. These mounting instructions are sort of complicated.

SC Roger.

CAPCOM Okay, the next step. Dim the interior lights, over.

SC Dim interior lights.

CAPCOM Roger. Next stop passive thermal control at gimbal angle, pitch 224, yaw 020, roll 270. Over.

SC Pitch 224, yaw 020, roll 270.

CAPCOM Roger. Next acquire on high gain antenna. Switch to auto tracks, now beam upon acquisition. Over.

SC Got it.

CAPCOM Okay. Yaw spacecraft left to get good view of earth and your rendezvous window number 2. You may have to pitch slightly as well, but primarily a left yawing maneuver to get a good view of the earth.

SC Got it.

CAPCOM Okay. This maneuver is going to put you very close to your scan limit for the high gain antenna, so while you are making the maneuver, check your lights. If your scan limit light comes on, you still have got 15 degrees to play with, but the only message is should you break lock, then you are going to back to go back and reacquire and do that maneuver over again, because you are going to be very close to the edge of your high gain antenna capability.

SC Thank you.

CAPCOM Okay. And then finally, now that you have got the spacecraft over there, aim the camera as required

to include the earth and the field of view and do not touch the body of the lens while lens while televising. Apparently, if you put your hand on the lens, it is felt it causes electrical interference. Over.

SC Okay, aim camera and do not touch lens while televising.

CAPCOM Right. And in all this sutff and all these pictures using the ALC, it is important that you let the camera stabilize for at least 10 or 20 seconds, to let the ALC do its thing.

SC Stabilize for 10 or 20 seconds. Thank you.

CAPCOM Right. Now we have some additional instructions in case this does not work. They say a full 20, Frank, on that ALC. It requires a full 20 seconds undisturbed for the ALC to properly do its thing. Now if these procedures that I've given you do not work, then we will be giving you some more and they had to do with other filters and various combinations thereof, so I have the polarizing filter and the red and blue filter holder at hand because we will be attempting to use those in addition to the red filters if this procedure doesn't work.

SC All very well, Mike.

CAPCOM That's all we have right now. We will have a few more remarks on the TV here coming up later. I would suggest that you get set up for this early and if you have any questions on it, shoot them down to us. We have a bunch of experts down here to help out.

SC Thank you, will do.

END OF TAPE

PAO This is Apollo Control, Houston. 54 hours 25 minutes into the flight. We have some conversation that has come in recently from the crew. We will play it for you now.

CAPCOM Apollo 8, This is Houston, over.

SC Go ahead Houston, Apollo 8.

CAPCOM Just a voice check, Frank.

SC Roger, Loud and clear.

CAPCOM Thank You.

CAPCOM Apollo 8, Houston.

SC Go Ahead Houston, Apollo 8.

CAPCOM Good, we would like some high bit rate data when you can get it blocked up on the high gain. We haven't had any of that for a while.

SC Roger, we will do that.

CAPCOM Thank You. How is that camera bracket thing working out?

SC We are doing alright now.

SC This is Apollo 8 transmitting to you on the high gain. How do you read?

CAPCOM Read you loud and clear Frank. Thank you.

SC Apollo 8 transmitting on the high gain antenna.

CAPCOM Apollo 8, Houston. You are loud and clear. Thank you for the high gain.

PAO And this is Apollo Control, Houston back. During the television pass this afternoon we don't know exactly what the crew is going to do, but you know from the earliler discussion that they are going to work with the telephoto lenses again with a filter application which we hope will enhance the image of the earth and it is also entirely possible they will swing it around --swing that camera around and take a picture of the moon if we are successful we should see approximately about a quarter moon. The eastern limb of the moon and in what detail, it is impossible for us to estimate. But those are the general plans to take a long look of the earth and hopefully a quick look at the moon. They will be about 45,000 miles away from the moon at that time. They are presently 174,000 miles from earth, they are moving in a velocity of 3300 feet per second. This is Apollo Control, Houston.

PAO This is Apollo Control Houston at 54 hours 35 minutes into the flight. We have established contact and Frank Borman says, among other things, that they have spectacular view of the earth. He goes into some little detail regarding a jet stream that they are observing. Mike Collins tells him he hopes that will hold up for at least another hour so we can all see it on television. Here is the conversation as it unfolds.

SC Houston, this is Apollo 8. Are you getting high bit rate all right?

CAPCOM That is affirmative, Apollo 8. We are getting good high bit rate.

SC Thank you.

CAPCOM Apollo 8, Houston.

SC Go ahead.

CAPCOM Roger. I've got some more talking to do about the TV any time it's convenient for you.

SC Go ahead.

CAPCOM Okay. First thing, we've made no provisions in these instructions for taking pictures of the moon and you could get some moon shots after it's all over by looking out a different window or by making some small maneuver, of course, we would be happy to have them. The show as scheduled is just out the window of the earth only. Over.

SC Roger.

CAPCOM The second point is, of course, when you stop your passive thermal control, you are about 90 degrees to the earth line, so when you make that yaw left, you are going to have to yaw left until your middle gimbal angle is in the vicinity of 60 degrees. You will get the additional 30 degrees by offset between where the camera is pointed and your +X axis. But the two together are going to total up around 90. We just wanted to make sure that you understood you were going to be working with a large middle gimbal angle. Over.

SC Roger, we understand that. We are also looking at the earth right now and there is spectacular long thin band of clouds. Looks like it may be a jet stream. It's absolutely spectacular, going almost all the way - half way around the earth.

CAPCOM Roger. Well, you might want to repeat that during the TV narrative and we would like you, if possible, to go into as much of a detailed description as you poets can on the various colors and sizes of those things and how the earth appears to you, in as much detail as you can possibly muster, over.

SC Roger. I figure we will have to do that because I bet you - I won't bet - but I bet the TV doesn't work.

CAPCOM Well, we won't take that bet, but anyway, we are standing by for a nice lurid description and we would suggest that you talk a little bit slower than you did yesterday, over.

SC Okay.

CAPCOM And the only other thing on this TV is that the experts tell us that do not point with the wide angle lens on the camera. Do not point at either the earth or the moon, it comes close to damaging the interior of the instrument due to the fact that is too bright, over.

END OF TAPE

PAO This is Apollo Control, Houston 54 hours 50 -- almost 54 minutes into the flight and the spacecraft presently 174,800 miles from the earth. A word or two here on a change in our charts and a change in our reporting procedure which will come up following the passage of what we call MSI or moon sphere of influence. That event to take place in about a half an hour from now. We've been reading the reporting we have given you on distance and velocity is coming from a chart called the Command Service Module Space Digitals and it presently uses as a reference, the earth. Now at some point shortly after we pass the pass into the sphere of influence of the moon the reference will become the moon and we will have rather sharp and dramatic change of the velocity reference. For instance, the velocity at precisely at the passage in relative to earth terms will be 3261 feet per second. Relative to the moon, that same velocity reading will be 3989 feet per second. And from that point we will be giving you velocities in relation to the moon. which will be exercising the gravitational effect at that point. Our present estimate is that at MSI the moons sphere of influence point, the moon will be 33821 miles from the spacecraft and the spacecraft will be 176275 miles from earth. Both of those are nautical miles. In the last 10 to 15 minutes the crew has put in one call simply to establish communications. We have had nothing more than a "Roger, we read you loud and clear." And at 54 hours 56 minutes into the flight this is Apollo Control, Houston.

END OF TAPE.

SC Houston, This is Apollo 8. We have the television camera pointed directly at the earth.

PAO This is Apollo Control Houston. Frank Borman has come up a little bit earlier -- a little earlier than anticapted, but let's buzz this picture out. It is -- The bright blob on the upper right is the earth.

SC Roger. I got you.

CAPCOM Okay. We are just picking it up at 3 o'clock on our screen.

SC Okay.

CAPCOM It is moving up toward 1 o'clock and in toward the center. Keep it going in that direction.

SC Okay.

CAPCOM You're looking better. You're holding it about 1 or 2 o'clock. Looking better. Give us a little more in that same direction. You're down at 3 o'clock now. We see about half of what you see. Too much. It is disappearing at our 5 o'clock. Now it is coming back. It is half off the screen at our 2 o'clock. It has disappeared off at our 3 o'clock. There, it is coming back in now. It is headed toward the middle of our screen. Mark. It is right in the center of our screen. Just hold her - hold her steady it is really looking good. Okay. we have --

SC What you're seeing Mike is a. Houston, what you are seeing is the Western Hemisphere. Looking, the top is the North Pole. In the center, just lower to the center is South America. All the way down to Cape Horn. I can see Baja, California and the southwestern part of the United States. There is a big cloud bank going northeast, covers a lot of the Gulf of Mexico up to the eastern part of the United States. It appears now that the east coast is cloudy. I can see clouds over parts of Mexico, the parts of Central America are clear. We can also see the white bright spots of the subsolar point on the light side of the earth.

CAPCOM Roger. Could you give me some ideas about the colors, and also, could you try a slight maneuver. It is disappearing, we see about half of it. It is going off to our 12 o'clock. Now it is going off to our 3 o'clock. That is the wrong direction. Yes, that is a good direction. We need another small correction to bring it it to our center screen. If you could maneuver toward the terminator, that is the part of it we are missing. We are getting the lighted portion. There you go, that's fine. Stop it right there.

SC Okay. For colors, waters are all sort of a royal blue, clouds, of course, are bright white, the reflection off the earth is much greater than the moon. The land areas are generally a brownish, sort of dark brownish

to light brown in texture. Many of the -- borders of the clouds can be seen by the various weather cells. A long band of various cirrus clouds that extend from the entrance to the Gulf of Mexico going straight out across the Atlantic. The terminator, of course, cuts right through the Atlantic Ocean right now. Going from north to south. Southern Hemisphere is almost completely clouded over, and up over near the North Pole there is quite a few clouds. Southwestern Texas and southwestern United States is clear. I would say there are some clouds up in the northwest and over in the northeast portion.

CAPCOM Roger. Could you maneuver toward the terminator again, please? A little bit more. Stop her right there and hold it. It keeps slipping up a little bit. Could you maneuver slightly more toward the terminator?

PAO That is the North Pole at the lower left portion of the earth. At about 8 o'clock.

SC How is that, Houston?

CAPCOM We are getting about half of the earth, Frank. The top half, our top half which includes the dark portion in it is obscured.

SC How is the definition on the picture?

CAPCOM Looks pretty good.

SC Can you see the cloud patterns at all?

CAPCOM That is affirmative.

SC Good. How are still seeing, Houston?

CAPCOM Yes, we are seeing it. We are missing the portion of the earth that is over toward the terminator. The dark portion of the earth is what we are not picking up. We are getting about 3 quarters or four fifths of the rest of it.

SC Roger. I will move it. Tell me when I am getting better or worse please.

CAPCOM Good. Stop right there. That is worse, Bill. Go back where you were. You made it disappear to our 3 o'clock. Now it is coming back. Okay. Stop right there. Now you are back where you were. We need a motion that is about 90 degrees to that last one you gave us. That is the wrong 90 degrees. 180 degrees away from that one. Stop right there. Okay. Now we have lost a different half of it. I need a motion 90 degrees to that last one. That is good right there, Bill. That is good right there. Apollo 8, Houston. If you can stick your polarizing filter in front of the camera without

disturbing anything else, it might improve the quality slightly.

SC Stand by.

CAPCOM Roger Bill.

SC Okay. The polarizing filter is in front. How is it now, Mike?

CAPCOM Still looking good. That didn't make much of a change one way or the other, but in general, considering how far away it is, it is looking excellent.

SC Well, I hope that everyone enjoys the picture that we are taking of themselves. How far away from earth now, Jim, about?

CAPCOM We have you about 180 000

SC (Lovell) You are looking at yourselves at 180 000 miles out in space. Frank, what I keep imagining is if I am some lonely traveler from another planet what I would think about the earth at this altitude. Whether I think it would be inhabited or not.

CAPCOM Don't see anybody waving is that what you are saying?

SC I was just kind of curious if I would land on the blue or the brown part of the earth. You better hope that we land on the blue part.

CAPCOM So do we. Babe.

SC (Borman) Jim is always for land landings.

CAPCOM Frank, this picture is drifting off center again. If you could make another correction to bring it back, I couldn't tell you which direction, but you're going the right way, you're going the right way. A little more, a little more, whoa stop right there. That is the best centering we have had Apollo 8, if you could just hold that it would be perfect.

SC To give you some idea, Mike, of what we can see, I can pick out the southwest coastline of the Gulf and where Houston should be, and also the mouth of the Mississippi, I can see Baja, California, and that particular area I am using a binocular that we have aboard.

capcom Roger. That understand.

SC This is an 8 power instrument that I have.

CAPCOM Right. Well, we are seeing the entire earth now including the terminator. Course we can't see anything past the terminator at all. Are you able with your binoculars to see the dark horizon? Anything past the terminator?

SC Negative, Mike. We can't see anything past

the terminator with the binoculars or with them. This earth is just to bright to and it cuts down the night adaptation to see anything on the dark side.

CAPCOM Roger, understand.

SC Since this is winter time. Since this is winter time in the northern hemisphere, we can see all of the South Pole and the southern ice cap, and not to much of the North Pole. Hey, you and Jim better get together. Jim just said he saw the North Pole.

CAPCOM He is looking out a different window.

SC That is what makes the difference.

CAPCOM Do you still have the --

SC He has the binoculars upside down.

CAPCOM Do you still have the polarizing filter in front of the camera?

SC Negative.

CAPCOM Okay.

CAPCOM Try putting it back in front of the camera one more time.

SC (Inaudible) Okay?

CAPCOM And once again we need a small attitude correction. Our earth is disappearing up and to the right. Our earth and your earth. The wrong way, wrong way. A little bit more. Okay. That is fine if you can hold it right there. Oops, no it is slipping back off again. Okay. Keep coming a little bit more, a little bit more. Okay. 90 degress to that direction. That is the wrong 90 the other way. There we go. A little bit more. Nope, wrong way, wrong way, I am sorry. Keep coming in that direction. No, it is gone up at our 12 o'clock. There we go it is coming back down. There we go, it's coming back down, it's coming back down. Bring it down a little bit more. Okay. Stop. Now we need 90 degrees to that direction again.

SC I hope that the next camera has a sight on it.

CAPCOM Roger.

SC How is that.

CAPCOM Well, that has disappeared, just practically. We were wondering if there was any change of your looking out one of the other windows and seeing the moon? Hey, it is coming back in, Bill. Okay. Hold it there. That is just fine for the earth. That is extremely good on the earth if you can just hold that.

SC It has the polarizing filter in front of it now, Mike.

CAPCOM Roger. Thank you and it is centered very well. We get a very slight improve with it but in general it is very good considering the distance.

PAO Our present distance from earth is 175 803 175 803.

SC Mike, I think we will have to save the moon for another time.

CAPCOM Roger. I understand. You are still very well centered with your picture. We noticed a couple of jumps in the apparent intensity. Did you make some filter change?

SC Roger. We tried to put that other red filter in front of it, but it didn't seem to fit.

CAPCOM Roger.

CAPCOM We would -- on a final test when you get down to the end of your allotted time here, we would like you to remove all filters and let us see how it looks with all filters removed, and then we would like to get several spot meter readings at the very end of the test.

SC Okay. We will be removing the red filter now.

CAPCOM Roger.

SC Do you still have us, Mike? The lens is off.

CAPCOM Roger. We have it, and if you could maneuver it toward the terminator slightly you would again center our picture.

PAO The spacecraft is almost directly over dead center South America. This picture is beaing received simultaneously through our antenna at Madrid and at Goldstone California.

SC Is that the right direction?

CAPCOM That is the right direction. Keep coming. Now that is the wrong direction, Frank. Did you --

SC (Inaudible)

CAPCOM Well, negative. I need another maneuver toward the terminator. It is drifting off the screen to our 11 o'clock. We appear to need a maneuver toward the terminator.

SC Thank you.

CAPCOM No, that is the wrong direction, Frank. We are starting to lose the picture. There you go. That is the correct way.

SC Okay, Houston. How's that for today?

CAPCOM That is just fine, Frank. That's great. We would like to at the conclusion here take 3 spot meter readings. You can do that at any time at you convenience. We would just like to get some after the fact readings on the luminous intensity.

SC Roger. Jim has got the spot meter out now.

CAPCOM Thank you.

SC Is it centered now, Houston?
CAPCOM Now quite, Frank.
CAPCOM That's good right there. Hold that right there. That's perfect.
SC Okay, earth. This is Apollo 8 signing off for today.
CAPCOM Good show, Apollo 8. We appreciate it. See you manana.
SC Roger.
CAPCOM We have Haney down here following your trajectory, so all is well. He says 10 minutes from the moon's sphere of influence.
SC Okay. Good.
PAO This is Apollo Control Houston. We bring that raps up tour television viewing for the day. The picture started -- I have to go back and get a hack on it -- I would estimate about 5 minutes of 2. Stand by and we will get an exact start time. We had not anticapted the starting of the pass until about 5 or 6 minutes after the hour. The crew moved in on us a little early as they did yesterday. I guess we should have anticapted it. When we began receiving a signal through Goldstone. Stand by one. We have had word from our station on Goldstone that they suspect that their reception may be even sharper than what we were receiving back here in Houston. We are going to get an early relay on that. We are still awaiting ahere a start time our assistant is trying to get it for us. Well, we go with the estimate of 1:58 pm EST and the signal went off at approximately 2:20 pm CST. Both of them are -- The spacecraft now 176 000 miles from earth. Its velocity in relation to the earth is 3265 feet per second. This is Apollo Control Houston.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/23/68, GET 5538 229a 167/1

PAO This is Apollo control, Houston, at 55 hours 38 minutes into the flight and we have been asked for a reaction here in the control center during that television passage. I think the remark from Lovell got the most reaction was in his description of the blue and brown Earth and not being sure of whether he would land on it. This triggered a tremendous spike of laughter, the likes of which I can't recall, which immediately settled down to business and in general the room the - there was just zero talking going on in the room at the time except for what we all heard from Mike Collins in an exchange which the crew and as we have been talking the Apollo 8 has passed the - into the Moons sphere of influence and quite literally this is a historic landmark in space flight because for the first time a crew is literally out of this world, they are under the influence of another celestial body. The Moon from which the Earth 33 820 straight line nautical miles. We indicated eariler our space digital charge at some point not yet completely clear we'll switch over and start giving us Moon related values. That switch just took place and we immediately have configured, velocity is now 3989 feet per second in relation to the Moon and the last value in relation to the Earth was 3261 feet per second in relation to the Earth. We'll see this number go down off the Moon related figure over the coming period. We have some tape just prior to the start of this transmission, we will play that for you now..

SC Houston, Apollo 8, returning to the PTC in those.

CAPCOM Alright, Houston, understand, returning to PTC. Thank you.

SC Roger.

CAPCOM You can tell Jim he is getting pretty ham handed with that P21, he got a parallel altitude three tenths of a mile off what we are predicting down here.

SC Is that right.

CAPCOM Rog. Apparently you have got 69.7 and the ITC says 70.

SC Are we going to leave it at that or are we going to correct it to make it lower.

CAPCOM We are talking about it, Frank.

SC We have got a lunar reading of about between 1 and 1.25 - 1.25 K.

CAPCOM Roger, understand, between 1 and 1.25 K thank you.

SC Houston, Apollo 8.

CAPCOM Alright, Houston.

APOLLO 8 MISSION COMMENTARY, 12/23/68, GET 5538 229a 167/2

SC Roger, if you put your CMT to accept we will send you our state vector.

CAPCOM Touche'.

PAO And that wraps it up from Apollo 8 and now - and now presently 33681 miles from the Moon and moving in a Moon related velocity 3989 feet per second at 55 hours 42 minutes into the mission, this is Apollo control, Houston.

END OF TAPE

PAO Apollo Control, Houston here. 56 hours 3 minutes into the flight and in the last 15 to 20 minutes we have had a most interesting discussion with the crew. Like getting Frank Borman's reactions primarily to the television pass. He was advised by Mike Collins that fortunately today those spectacular views of the earth had no competition had no football games to compete with and Borman allows as how he hopes a football game wasn't stopped to see the view from space. That pretty well sums up Frank Borman's extraordinary interest in the game of football. Here is the conversation.

SC Houston, Apollo 8.

CAPCOM Apollo 8, Houston.

SC How does everything look, Mike. All our systems and everything. See any switches out of place?

CAPCOM Negative, I'll take a check around here but it is looking good, just a second.

SC We are all in the cabin Mike like monkeys and I wanted to make sure we didn't hit anything.

CAPCOM Apollo 8, Houston. Everything is looking good down here all ... and systems are GO.

SC Thank you.

CAPCOM We are reading you loud and clear Frank.

CAPCOM We are having a playback of your TV shows and are all enjoying it down here. It was better than yesterday because they didn't pre-empt the football game.

SC Don't tell me they cut off a football game, didn't they learn from Heidi?

CAPCOM You and Heidi are running neck and neck in the telephone call department.

END OF TAPE

CAPCOM Apollo 8, Houston.
SC Go ahead, Houston.
CAPCOM Roger. We will be switching antennas from Madrid to Goldstone in another 3 minutes. You can expect a glitch on your comm.
SC Thank you.
CAPCOM Apollo 8, Houston. We are reading you loud and clear through Goldstone, over.
SC Television on now and we are trying to maneuver to the earth.
CAPCOM Roger, understand.
SC Houston, Apollo 8.
CAPCOM Apollo 8, Houston. Over.
SC (LOVELL) Roger. We are maneuvering the position now for the TV. Bill has got it set up in Frank's left rendezvous window and I'm over in Bill's spot looking out the right rendezvous window. The earth is now passing through my window. It's about as big as the end of my thumb.
CAPCOM About as big as the end of your thumb at an arm's length.
SC That's right. I think what we see now is South America down below us.
CAPCOM Roger. Is the TV camera pointed at about 30 degrees yaw level from the +X-axis?
SC Stand by. We're checking it. We think we've got it in the right position, we are going into position now.
CAPCOM Okay.
SC Houston, are you getting any sort of picture?
CAPCOM Apollo 8, Houston. Negative, not yet.

END OF TAPE

PAO This is Apollo Control at 57 hours 11 minutes into the flight. Here in Mission Control Center, we've completed the change of shift and Flight Director Milton Windler has gone through the status of the mission with his flight controllers. Now, at the present time, we are preparing for a midcourse correction. This will be the second performed on this translunar leg of the Apollo 8 flight. That first maneuver was, of course, performed with the service propulsion system engine, Midcourse maneuvers number 2, numbers 2 and 3, now which had been included in the flight plan, were not performed because of the small amount of correction needed and our estimate, at this point, is that midcourse correction number 2 will be for about 3 feet per second and will occur at the nominal time in the flight plan of about 61 hours. We've had two brief conversations with the crew since our last report. We'll play those back for you now.

SC Houston, Apollo 8.

CAPCOM Go ahead, Apollo 8.

SC Hey, Jerry, how much water does this, the water dispenser in the lower equipment bay, the one that puts out hot and cold water, how much comes out of that with each shot?

CAPCOM Stand by. I'll take a check on that. And by the way, welcome to the Moon's sphere.

SC The Moon's fair?

CAPCOM The Moon's sphere - you're in the influence.

SC That's better than being under the influence. Hey, Jerry?

CAPCOM Go ahead, 8.

SC My handy LMP added schematics out of the drop of a hat and informs me that it's 1 ounce per cycle.

CAPCOM Apollo 8, looks like the flying EECOM and the ground EECOM came to a dead heat on that one.

SC They did?

CAPCOM We got the same answer at the same time.

SC I'll have Bill put it on the tape recorder and send it down.

CAPCOM Apollo 8, Houston.

SC Go ahead, Houston, Apollo 8.

CAPCOM Okay, 8, we want to run a little exercise on the ground here to make sure that we're able to dump the tape and bring the voice portion back to Houston in a timely manner. So we plan to dump your tape and we're going to exercise the procedures on the ground to get it back here and take a listen to it. We believe that we have something on the tape already unless you have recorded over it after the last dump. Just to make sure, we'd like to have you just say a few words, give us a short count or something on the tape and anything that you

might want to put on there. And we're going to do this in the next 5 minutes before we get away from Madrid. In fact, we want the exercise so we'll go ahead and do that and we'll tell you before we make the dump.

SC Houston, this is Apollo 8, over.

CAPCOM Go ahead, Apollo 8.

SC Okay, kid, we put a few comments on the last of the tape after we heard from you and it's being rewound now and you can have it as soon as we get it back to the beginning.

CAPCOM Okay, we'll have to wait. It looks like you are going out of the attitude to use high gain. We'll catch it next time around and then dump it.

SC Okay, I know this would be better in high bit rate though it will probably take quite awhile.

CAPCOM All right.

PAO And that concludes the conversation that we had with the spacecraft during the press conference. At the present time, Apollo 8's velocity, as it moves toward the Moon now, is 4011 feet per second. So we are beginning to see an increase in velocity as the spacecraft comes under the influence of the Moon's gravity and begins to accelerate toward the Moon. Our height above the Moon is also showing a continued decrease and now reads 30 021 nautical miles. Marilyn Lovell, Apollo 8 Command Module Pilot Jim Lovell's wife was in the viewing room at Mission Control Center for about 30 minutes, viewing activities here in the Control Room and talking with Dr. Robert Gilruth in the viewing room. And she heard the rather brief conversations with the spacecraft during that period of time and she has now left the Control Center. At 57 hours 16 minutes into the flight of Apollo 8, this is Mission Control Houston.

END OF TAPE

APOLLO 8 MISSION COMMENTARY,12/23/68,GET 573200,CST 4:23p,171/1

PAO This is Apollo Control at 57 hours 32 minutes into the flight of Apollo 8. Now we are in contact with the spacecraft at this time and Bill Anders reports that both Frank Borman and Jim Lovell are sleeping at the present time. And we have passed up some preliminary information to the crew on the mid-course correction that they will be performing at 61 hours in their flight. We will bring you up to date with the tape on every part of that conversation and stand by for any live communication with the spacecraft.

CAPCOM Apollo 8, Houston.

SC Go ahead, Houston.

CAPCOM Rog. Do you think we're in a position where we could use the high gain?

SC I believe we could.

CAPCOM Okay.

CAPCOM Apollo 8, Houston. We're dumping at this time.

SC Roger. (garble)

SC We ought to also get a check on it at mid-rate per TSC voice.

CAPCOM Apollo 8, are you saying that everything that's on there now is in high bit?

SC That's where my switch is.

CAPCOM Okay. We'll take a look at it then. It was making - It was previously recorded in low bit. After awhile we'll come back and maybe take a look at that, too.

SC Okay, we might can wait until we get in a little closer to the Moon to put as big of strain on it as we can.

CAPCOM Apollo 8, Houston.

SC Go ahead Houston.

CAPCOM Okay, we've completed the dump and the tape recorder's back to where you can use it any way you want. We may want to dump that thing again, and if we do we'll go ahead and use the same information unless you have something else that you specifically wanted to put on there later. Listening to the voice call to you - it sounds real good. We're coming up on a mid-course four and right now it's - talking about doing it on time and you can anticipate the burn in the neighborhood of 3 foot per second. We're considering and would like for you to think about the possibility of doing this burn using the onboard vector and just have us update the vector in the lens slot, so that you will have the midcourse vector on board. But it looks like it won't have any big effect on the burn result and it might prove interesting. So if you think about that one for a bit, let us know if you have any suggestions or thoughts on the subject.

SC Rog. You say it uses the onboard vectors

SC and leaves the midcourse vectors on the lens slot.

CAPCOM That's affirmed, if that's what you would like to do, right. We considered it and looks like that would be a reasonable thing.

SC Roger. Frank and Jim are asleep now and I'll bring this up to them when they wake up.

CAPCOM Okay, real fine.

CAPCOM Apollo 8, Houston. How about turning up the oxygen?

SC Okay, it's turned up.

PAO This is Apollo Control and it appears that we have no more communications with Bill Anders during this period. We would also judge that the crew is following the advice of the ground given out yesterday that they set their down pace and sleep when they feel they need it. As you heard Anders report both Borman and Lovell are sleeping at the present time. Apollo 8 is continuing now to accelerate toward the Moon. The current velocity reading is 4018 feet per second now that's up about 10 feet per second in velocity in the past 30 minutes. And our current altitude now stands at 29 048 feet or rather 29 048 nautical miles above the Moon. This is Apollo Control at 57 hours 40 minutes.

END OF TAPE.

APOLLO 8 MISSION COMMENTARY, 12/23/68, GET 580000, CST 4:51p 172/1

PAO This is Apollo Control at 58 hours into the flight of Apollo 8. We've had no communications with the spacecraft since our last report, and here in Mission Control it has also been rather quiet. At the present time the spacecraft is at an altitude of 28 225 nautical miles from the moon and velocity reads 4024 feet per second. Coming up in just a little under 3 hours we have a midcourse correction maneuver scheduled. This is listed as midcourse correction number 4 in the flight plan and will actually be the second midcourse correction on route to the moon. Midcourse corrections 2 and 3, which were listed in the flight plan, were such low values that they were not performed and we anticipate that midcourse correction coming up will be for about 3 feet per second, a burn of about 3 feet per second using the spacecraft reaction control system. At 58 hours 1 minute this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 58 hours 12 minutes. We have just been in touch with the spacecraft and received a status report from Bill Anders on the condition of the spacecraft windows at this time. We'll play back that conversation for you and then stand by briefly, for any further communications with the spacecraft.

CAP COM Apollo 8, Houston.

SC Go ahead Houston.

CAP COM Okay Bill, I guess I want to belay my laughs throughout, using the on board state vector 4NCC4. Now after looking at it somemore on the ground, they've got to get going on making their paths and doing all their computations. And rather that put it off or do it twice, we're going to go ahead and go with the procedures we've been using all along. On the lunar orbit stuff, we've been looking it over and we got several guys, Jack Smith, accompanying in the back room, looking at what effect your windows have. And basically it looks like there's two options that will make an impact on that REV 2. One of the options, of course, will be just to have you and Jim change seats and let Jim look out and get his SAM that way, and another option will be to roll the bird over and let Jim point the optics as far forward as he can get them and take his SAM through the telescope. And I guess we'd like to have any thoughts that you folks have on what you think you can do with the windows, if you have anything we'd like to sipher it into our thinking and go ahead and firm up our plans as early as we can. We'd like not to put it off so that we have none of these things to do after midcourse. You folks can probably tell us more about what you can do with those windows. So if you have any thoughts, go ahead and sing out with them and we'll see what we can do about fencing that in.

SC Okay. With reference to the midcourse, I think that's generally agreed upon. That we do it like we've always been doing it. Now with respect to the windows, spare windows, essentially, are useful. The 2 side windows are, may be all right for observation, and the problem with the rendezvous windows is that they're pretty small. And I just thought we'd have to play the window game by ear. Not really sure what capability we're going to have. And we'll give you somemore thoughts on this later.

CAP COM Okay, how about exercising the idea of rolling over and having Jim do his polarization through the telescope because if we have to change attitudes we'd like to go ahead and start thinking about what effects that'll have on such things as antenna orientation and all that.

SC Okay. We'll - I'll mention it to them when they wake up.

APOLLO 8 MISSION COMMENATRY, 12/23/68, GET 581200, CST 5:02p 173/2

PAO And it appears that we'll have no further communication at this time with Bill Anders, aboard the spacecraft. We're continuing to monitor the velocity and altitude as it approaches the moon. At the present time, our velocity reading is 4030 feet per second and we're at an altitude, above the moon, of 27 575 nautical miles. Our predictions, in Mission Control Center, are that the velocity will, of course, continue to accelerate as we approach the moon rather slowly for the next 7 hours or so and we anticipate that by about 65 hours the velocity will be somewhere around 4350 feet per second. That would be an increase of about 300 feet per second over what we're showing now. The dramatic increase in the velocity will come between 65 hours and 69 hours, at the point of lunar orbit incersion, when the velocity will just about double, going from 4350 feet per second up to about 8420 feet per second. At 58 hours 18 minutes into the flight this is Apollo Control, Houston.

END OF TAPE